Chronic, Massive Pneumoperitoneum in a Patient Without Signs of Peritonitis: A Case Report

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ABSTRACT

Pneumoperitoneum is the presence of air in the abdomen. This can be due to a wide variety of etiologies, many of which are surgical emergencies, yet it can also present as a chronic symptom of underlying pathology. This can be due to primary (idiopathic) or secondary causes, of which the causes are numerous. This can even be due to other pathology unrelated to the GI tract, such as pathology of the thoracic cavity.

We present a case of chronic pneumatosis intestinalis that was due to peritoneal blebs likely secondary to an alveolar-peritoneal fistula through the right hemidiaphragm.

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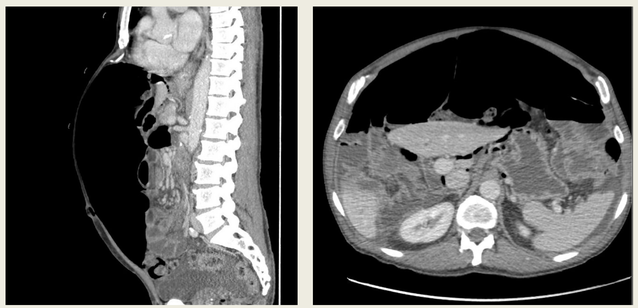
INTRODUCTION

- Pneumoperitoneum is the presence of free air in the abdominal cavity seen on plain abdominal radiography or with CT imaging. This can be due to a wide variety of etiologies. In 66% of these cases, this will present as a surgical emergency with peritonitis
- Can be seen in infection, trauma, perforation, iatrogenic causes, and others
- Pneumatosis intestinalis, which is the presence of free air in the extraluminal space, can be due to other pathology unrelated to the GI tract:
- Pulmonary disease, such as COPD and asthma, autoimmune conditions, and drug-induced causes
- It can sometimes be a benign symptom as well.
- We present a case of chronic pneumatosis intestinalis that was present in the patient for over two years and presented with relatively minor, nonspecific symptoms.



CT Imaging Findings

Case

- 62-year-old male without significant PMH presented with abdominal bloating and cramping ongoing for the last two years.
- Endorsed significant unintentional weight loss of approximately 35 pounds in the last two years, early satiety/pain, excessive bloat
- Intermittent diarrhea but has otherwise been having regular bowel movements. He had not had any fevers or chills.

- The patient had previous work-ups which had not revealed a clear cause for his ongoing symptoms.
- Positive breath test significant for SIBO. Negative for celiac disease.
- Upper endoscopy and colonoscopy had been performed, which showed normal mucosa and colonic diverticulosis.
- CT abdomen significant for massive pneumoperitoneum, as well as fluid-filled prominent loops of small bowel concerning for ileus or obstruction (**Figures shown**). Patient declined surgery at that time.
- Repeat CT imaging showed persistent pneumoperitoneum and interval free fluid in the pelvis. No site of bowel perforation that could be visualized. Repeat colonoscopy/EGD unremarkable.
- Diagnosis of chronic pneumatosis intestinalis of unknown etiology

- Diagnostic laparoscopy was recommended
- Significant amount of pneumoperitoneum noted, along with a moderate amount of serous fluid in the abdomen. No evidence of a leak noted
- Moderate-to-large small bowel diverticula noted, but no other pathology was visualized that could explain the free air.
- At the lower anterior diaphragm, the peritoneal surface had subperitoneal emphysema suggesting a potential thoracic source for the pneumoperitoneum.
- Peritoneal blebs along the diaphragm and liver noted. Thoracic surgery were consulted for exploratory right-sided thoracoscopy.
- Concluded that the etiology was most likely due to an alveolar-peritoneal fistula through the right hemidiaphragm.
- Surgical pathology of the biopsies taken from the diaphragm showed mesothelial lined inflamed fibro-connective tissue with multinucleated giant cell reaction and organizing serositis, which were negative for neoplasm.
- Thoracic surgery team would move forward with plans for a video-assisted thoracoscopic surgery (VATS) to evaluate further

DISCUSSION

- Pneumatosis Intestinalis can be secondary to a wide variety of pathologic etiologies. This can be due to primary or secondary causes.[1]
- Primary, approximately 15% of cases, is often due to idiopathic causes.
- Secondary causes can be seen in the setting of COPD, immunodeficiency, or acute GI pathology.
- Increased pressure in the abdomen, or the lungs and mediastinum, can result in gas diffusing across tissues and into the bowel wall.[1]
- Treatment and management varies
- Imaging studies are the best initial tool for investigation.

- Benign causes in the setting of chronic lung pathology can sometimes require only conservative medical management.
- Can also present with signs of acute abdomen and can fully resolve following treatment of the underlying pathology.
- Any surgical intervention for abdominal pathology will not aid with the underlying problem and will subject the patient to increased morbidity and mortality risk.

- For the thoracic causes of pneumoperitoneum that present non-emergently, the prevalence has not been able to be estimated.
- Some cited etiologies originating from the thorax include mechanical ventilation-induced barotrauma, pneumothorax, and cardiopulmonary resuscitation.
- Air passage from the mediastinum to the abdomen has been investigated. Possible causes include pleural/diaphragmatic defects, as well as through the diaphragmatic portals and along perivascular connective tissue into the retroperitoneum.[3] These are rare occurrences in which the passage of air into the mediastinum occurs and can fail to be visualized with typical imaging studies and even during diagnostic laparotomy.

CONCLUSIONS

- Free air in the abdomen in a patient complaining of pain and other abdominal symptoms is often a sign of a surgical emergency.
- This can rarely be a presentation of thoracic pathology, which can be benign and managed conservatively.
- Thoracic and pathology arising from the lungs should remain as a possibility on the differential in cases where air is visualized, yet the presentation and symptoms appear inconsistent with emergent etiologies.

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